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Quarterly Magazine of the Desert Botanical Garden, Phoenix, Arizona

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The Desert Botanical Garden is a privately funded, nonprofit institution supported by memberships, contributions and admissions. Founded in 1937 by the Arizona Cactus and Native Flora Society, the Garden is located on 150 acres in Papago Park in the heart of metropolitan Phoenix.

A living museum dedicated to education, conservation and research, the Garden encourages and promotes understanding of our unique desert habitats and the use of aridland plants and water saving techniques in landscaping.

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Quarterly Magazine of the Desert Botanical Garden, Phoenix, Arizona

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Contents

Front Cover: The entrance to the Garden from McDowell Rd. Only a remnant of the original brick entry gate remains today.

A Garden Chronicle,

Fifty Years of Planting and Growing

by Elizabeth Fritz

Elizabeth Fritz was the volunteer librarian at the Garden from 1976 to 1979. Always interested in "the people angle" of the Garden, she began compiling the Garden's history several years ago. She hopes to one day have a book published on the subject.

On Sunday afternoons some 50 years ago, a handful of Phoenicians in cars and wagons regularly braved the dusty miles to Scottsdale. Their destination — the Starck ranch, located on a pie-shaped wedge of land between Indian School and Scottsdale Roads and the canal. Their purpose — to hear Gustaf Starck, an engineer with the Salt River Valley Water User's Association, speak on the subject nearest to his heart, growing cactus and succulents.

Back in his native Sweden, the young Gustaf would have chosen to become a botanist. His fascination with succulents began during his boyhood when his father, a captain in the Swedish Royal Navy, brought home exotic plants from his travels. By 1919, when Starck was already a U.S. citizen and father of three children, he moved from Wisconsin to Arizona for his wife's health. His job surveying the desert brought him close to its extraordinary plant kingdom.

On his ranch Starck created a showplace of cacti and succulents. His meticulous research of desert plants collected with a state permit soon netted him a reputation that brought kindred spirits to his doorstep. On April 18, 1934, an informal discussion group of 16 men and women organized to become the Arizona Cactus and Native Flora Society. Their purpose — to save the desert with the creation of a botanical garden.

By 1934 Phoenix had grown to have a population of over 50,000. Desert plant life was being devastated by farming, mining, and by the construction of new buildings and paved streets. The Society aimed to display and interpret the desert to those who failed to appreciate its beauty, and to create a living laboratory of international importance. A botanical garden like the ones in Europe, Starck pointed out, would attract tourists and bring business and prestige to Phoenix. It would be , he said, "a valuable gem" in the city's crown.

Unfortunately, the general attitude was, why worry about the desert when there was so much of it? Newcomers, health-seekers from north and east, found more comfort in grass lawns, familiar flowers, and fast-growing shade trees than in the "spiney brutes." The ambitious plan of a botanical garden was foundering for lack of community support.

In May of 1936, although Starck's role remained large, his erudite leadership gave way to the more aggressive one of Gertrude Divine Webster. The lady from Vermont, who had inherited a large fortune from a family lumber business, was elected president of the Society after joining it at Starck's invitation. She wasted no time in rallying the right people to her adopted cause.

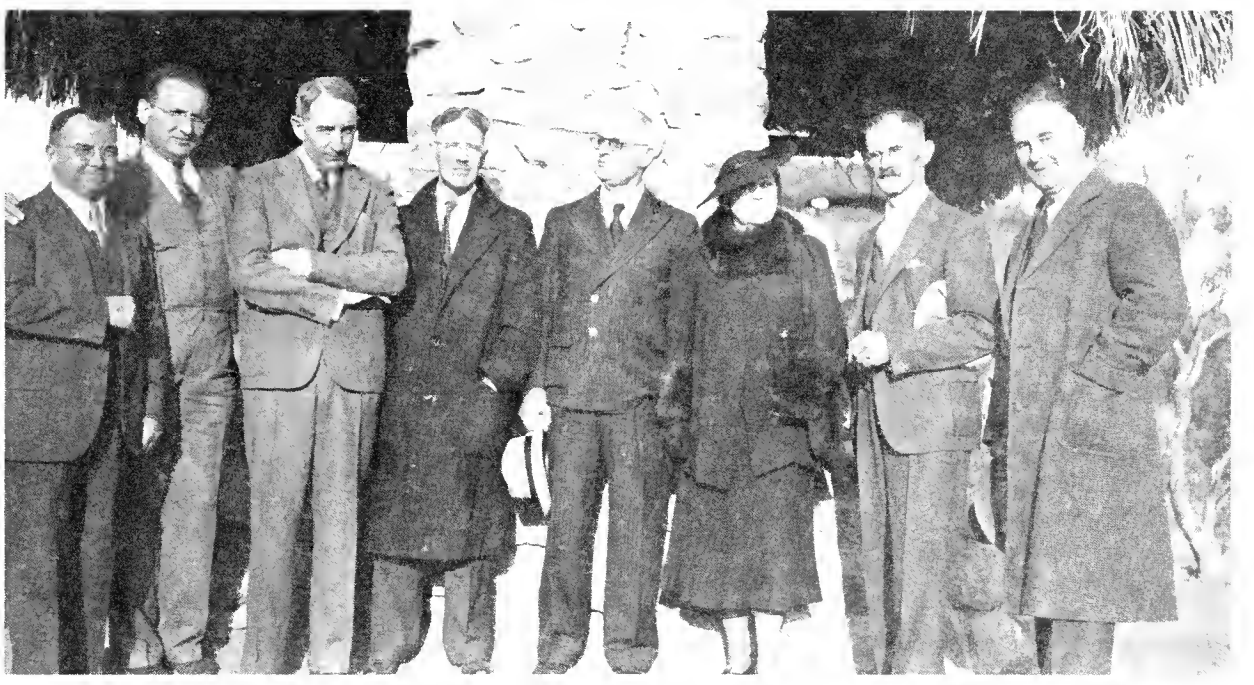
On January 2, 1937, the Society became the Arizona Cactus and Native Flora Society, Inc., a non-profit corporation. On May 30, 1937, it became a member of the national branch of the Cactus & Succulent Society of America. It adopted a slogan, "Not to destroy but to glorify," authored by Gertrude Webster.

At her country estate on the south slope of Camelback Mountain (just west of today's 56th Street) luncheon and dinner guests heard speeches by Jack Whitehead of the Boyce Thompson Arboretum at Superior; Dr. Forrest Shreve of the Carnegie Desert Laboratory in Tucson; and Professor John J. Thornber of the botany department at the University of Arizona. Owners of the *Arizona Republic,* the *Phoenix Gazette,* and radio station KOY were named to the advisory board. The public was invited to meetings featuring illustrated lectures on desert plants, in members homes. They were also invited to frequently held picnic meetings; a frequently-used meeting place was Papago Park, the site coveted for the proposed garden.

Once an Indian townsite, then decreed a national monument in 1914 because of its fine specimens of saguaro cactus and other desert flora, this land 12 miles east of the city limits belonged to the state at the time. Its terrain was both rolling and flat, enabling areas to have light and shade, where plants from desert climates around the world could flourish.

Webster organized a group to obtain a petition from the state which would have allowed them to lease a portion of the park land. The legislature rejected the first petition. While a second petition waited in what Webster called "the mysterious byways and subways of the Capitol," fund-raising and long-range plans continued. In April of 1938 the Society held its first cactus show at Col. Joe Thompson's Tropical Groves Nursery at the corner of Thomas Road and Chicago Avenue (now 44th St.) Among those attending were

Mrs. Webster's gardener who worked at the Garden



A few of the individuals who helped establish the Garden. Gertrude Webster is the third person from right. Can you help identify the others for the library archives?

1,000 Phoenix school children, all transported by Society members, among them the late John Rhuart.

Charles Gibbs Adams, Los Angeles landscape architect, who designed the estates of William Randolph Hearst and Cecil B. DeMille, was requested to make preliminary plans. From her summer home in Vermont, Webster helped design the Garden's layout — its plantings, buildings, roads and paths. She also assisted with the raising of $40,000.00, one fourth of which she donated.

On July 1, 1938, largely through the efforts of board members Harry M. Fennemore, an attorney, and M.H. McCalla, a building supply executive, a permit was made and entered into with the State Land Department and Department of Game and Fish for the Society to occupy "certain lands in former Papago Saguaro National Monument for an indefinite period" with the stipulation that the propagation and culture of cacti and native flora begin within six months.

On December 12, the first cacti, donated and salvaged, were planted. On February 12, 1939, the 306 acres were dedicated in a ceremony just north of Hole-in-the-Rock; the ceremony was attended by Governor Robert T. Jones, Mayor Walter Thal-

heimer, and about 200 dignitaries and local citizens. The *Arizona Republic* carried a half-page cartoon by Reg Manning, future board chairman, announcing the ceremony with directions to the site.

Scott Haselton, editor and publisher of the *Cactus & Succulent Journal,* recommended George Lindsay for the Desert Botanical Garden's first director. The 22-year-old botany student had just completed his junior year at San Diego State College. His salary of $100.00 a month was adequate for a bachelor in the days of gasoline at 9¢ a gallon and ice cream at 15¢ a quart.

"A gentleman from his toes to his nose" and "a tireless worker" is how Lindsay was described by Angela Bool. With her husband Herbert, Angela Bool ran the Sandyland Cactus Gardens on Camelback Road and served on the board. Herbert accompanied Lindsay on plant collecting trips in northern Arizona, Baja California, and along the Mexican border to collect plants for the garden.

Plants were placed in a segregated plan, first by counties, then states, then countries. As conceived by Adams, they were to look "as though the hand of man had never touched them." Early Garden visitors were prone to ask if anything had been planted yet, so successful was the natural effect.

Lindsay fenced the entire area with barbed wire, installed drain pipes and hauled in truckloads of topsoil, leaf mold, and granite boulders to build up plant beds. He was assisted by a crew of 25 National Youth Administration boys.

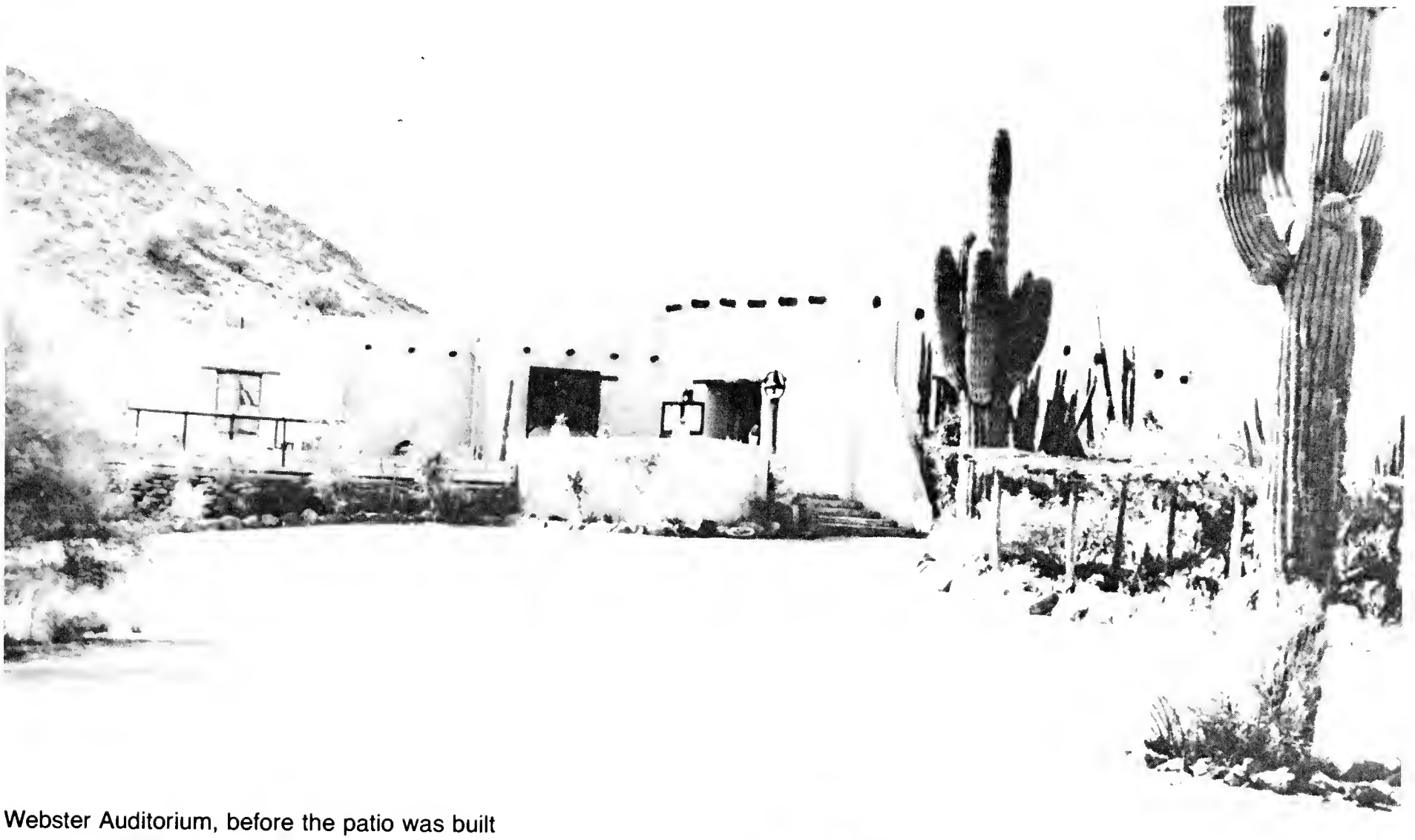
January 21, 1940 was a red letter day that promoted the Garden from a mere planting ground to an institution of scientific study. About 1,500 people attended the dedication of Webster Auditorium which provided an office and apartment for the director and guest rooms for visiting scientists. Negotiations with the Works Projects Administration for the building's construction had broken down due to innumerable government restrictions. Designed by architects Gilmore and Ekman, it was built by Broman and Chapman, low bidders at $13,000.00. The Society had $8,000.00 in the treasury. As usual, Webster came to the rescue to underwrite the balance, with the provision that each member assist in a state-wide drive for funds to reimburse her.

Gertrude Webster

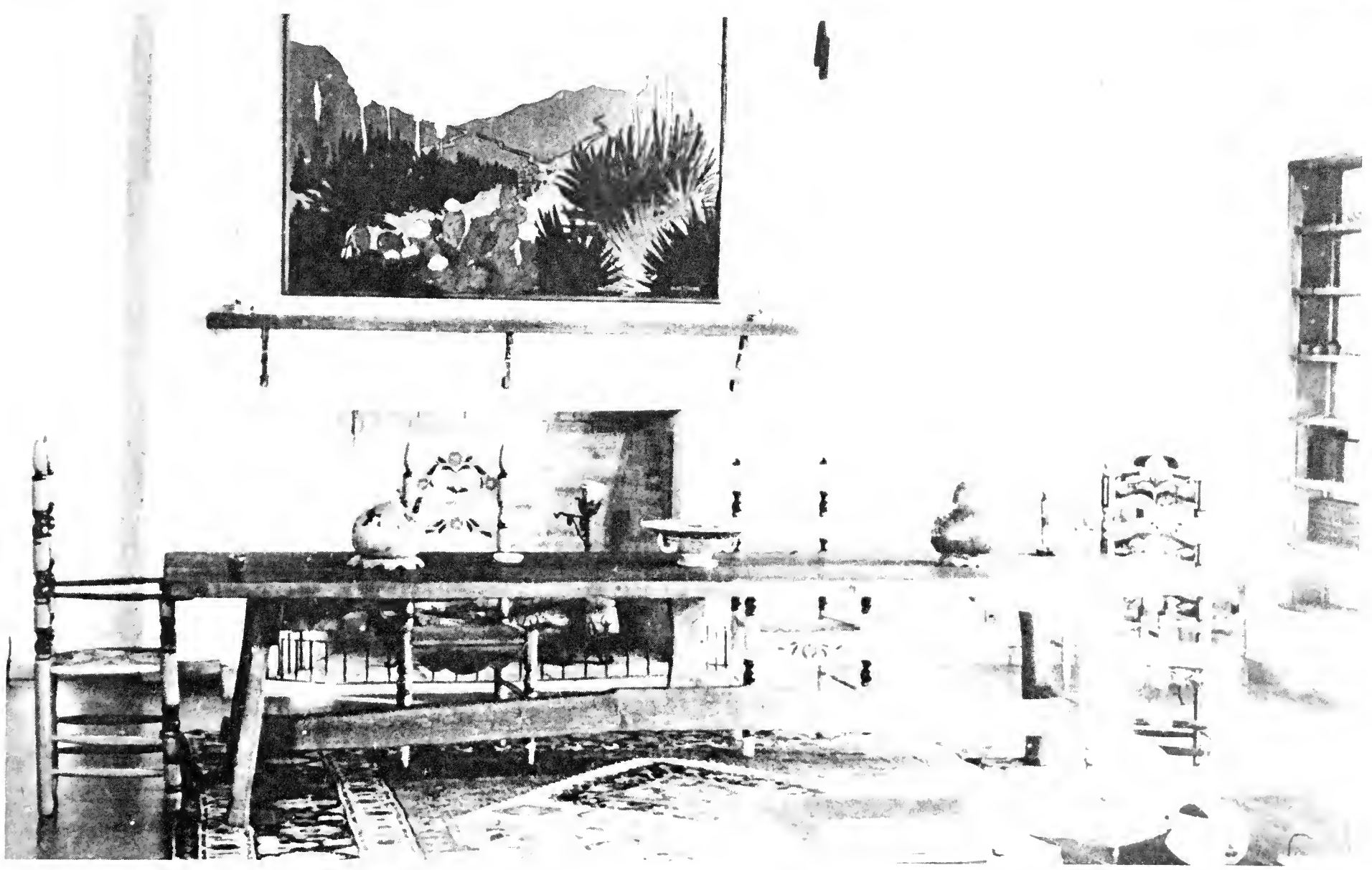
For Webster Auditorium Adams had recommended "an Indian feeling with a Mexican touch", that was perfectly achieved in the adobe, earth-colored structure that rises from its surroundings almost as if it had grown there. Ladies of the furnishings committee traveled to Nogales to buy Mexican chairs, tables and chandeliers. Artist Oscar Strobel's murals in Aztec motif were placed in the main hall and a bell from Webster's ranch at the entrance provided authentic details. Refreshments at the dedication ceremony were served at the dedication ceremony on new china and guests stood on Oriental rugs.

In May of 1940, Lindsay left to complete his education. Before leaving he observed the need for lath houses and a greenhouse for exotic plant collections. It was left for his successor, Charles Fleming, to deal with these and other problems. Fleming came to the Garden from Clifton, Arizona where he had taught high school science. He had a degree in ecological botany. Mrs. Fleming was hired with him to handle housekeeping and hostessing; the two earned a monthly salary of $150.00 plus living quarters.

From the beginning, Fleming was plagued with problems. Jackrabbits



Webster Auditorium, before the patio was built



Inside Webster Auditorium, with furnishings and Oriental rug

ate the newly-planted cacti. During the summer, water to his apartment arrived near the boiling point from pipes above unyielding ground. So solid was the underlying bedrock that it had to be blasted out with dynamite to create plant beds east of present Eliot Patio. Plants were watered by hand from a 1,000-gallon tank on a truck. Those sensitive to summer sun were wrapped in cheesecloth to prevent burning.

Fleming was, at times, discouraged. He deplored the lack of scientific equipment and he disliked the "Webster-dominated" board's emphasis on tea parties. On the positive side, he instituted a seed collection, weekly classes in plant lore for adults and children, and field trips. Remnants of stone pillars, put up by Fleming and the NYA crew at the Garden's north entrance, can be seen at the corner of McDowell Road and Galvin Parkway and on Van Buren St., on land now occupied by the Phoenix Zoo.

World War II forced the Garden to close in 1942. In the hands of one caretaker it fell victim to theft and vandalism. The adjoining military installation used it with reckless abandon as a drill ground. Shortage of gas also made it difficult for loyal members to drive "way out there" to water plants. Its patriarch, Gustaf Starck, died in 1945. Active members numbered only 19 in December 1946 when a new director, William Taylor Marshall, was faced with rehabilitation.

Marshall was a self-taught botanist. At the age of 61, he had been a house painter, sales manager for a cigar company and the head of an interior decorating firm. He had also been president of the Cactus and Succulent Society of America and published books and articles on succulents.

Marshall launched a membership drive with what one member called "Los Angeles high-pressure tactics." Increased publicity often focused on himself. A famed example was his assertion that the juice of barrel cactus could save life (on the contrary,

W. Taylor Marshall, director of the Garden from 1946-1957

it induces thirst and nausea). He began an intensive study of the medicinal properties of desert plants, advocating the brewing of squaw tea from twigs of the leafless shrub, Ephedra, that supplies ephedrine for nasal sprays.

Marshall added classes for Boy Scouts and school groups, Sunday afternoon lectures, and tours guided by himself until he put out a 10¢ guided tour pamphlet, "Nature Walk." In 1947 a mimeographed "Saguaroland Bulletin" appeared, and February of 1948 saw the first annual Cactus Show at the Garden, sponsored by the *Arizona Republic* and the Arizona Federation of Garden Clubs.

To assist Marshall, a full-time horticulturist was hired. His salary was small but it strained the budget. The NYA help had vanished in the war. All services were free, regular memberships only $2.00 per couple and the Garden's ailing benefactress had ceased footing the bills. There was talk of turning it over to the state.

Then, on March 31, 1947, Gertrude Webster died, leaving all income from her Arizona properties in trust to the Arizona Cactus and Native Flora Society for the administration of the Desert Botanical Garden, with the provision that there would always be at least 200 members in good standing.

Her friend and fellow-crusader, Lou Ella Archer, founder of the Phoenix Humane Society, secured the necessary memberships. Named in her honor was the superintendent's residence built in 1950, along with the first aluminum lath house. In 1950 E.R. (Jim) Blakley, a botany student at Arizona State College, began assembling an herbarium in the closet-size room at the east end of the auditorium. Dr. James McCleary of ASC and consulting botanist from 1955 to 1960, was slated to become director. This never occurred; Marshall died in 1957.

W. Hubert Earle, who had been with the Garden 10 years as gardener, chief horticulturist and superintendent was then made director. Originally from Winnipeg, Canada, he, too, had come to Arizona for his health and was self-taught in botany. "We lived on beans," Earle said of those early days. He and his wife and sons lived in a trailer on the grounds until Archer House was built. Earle helped Marshall give lectures at resort hotels, an inducement to guests to stay over an extra night to vist the Garden. Marshall felt the Garden a more worthy tourist attraction than

An overview of the Garden in 1954

one Phoenix merchant's idea of offering free orange juice on downtown streets.

In 1959 an event of utmost concern to the Garden took place — the sale of Papago Park to the city of Phoenix. Despite assurances from Garden counselor, William Eliot, member of the Parks and Recreation board, the city took over about half of the Garden's leasehold. The building of Galvin Parkway cut off the northwest section from Barnes Butte to the cross-cut canal. In 1961 another strip near Hole-in-the-Rock was reluctantly released for park development, leaving the Garden land diminished to 123.75 acres.

Earle expanded a seed exchange program started in 1954 with Australia. Forty-five countries now participate in this program. In 1960 he built the Visitor's Center, or bookstore. Until then "the store" had been "the table" in a corner of the auditorium where Therese Marshall and Lois Earle sold booklets and curios.

Ensuing years saw the building of the Leaf Succulent lath house in 1965; the library to house the gift of Max Clemens Richter, collector of botanical art and literature in 1968; and the herbarium dedicated to the late Lois Porter Earle in 1972.

It is in the herbarium that J. Harry Lehr, retired eastern banker, indulged his zeal for plants between 1970 and 1984 by enlarging the collection begun by Jim Blakley, and explorer-botanist Dr. Howard Gentry who has researched the genus agave, jojoba, and guayule. Gentry's monograph "Agaves of Continental North America" was published by the University of Arizona in 1982. (Earle died in 1984 after retiring in 1976.) By that time a volunteer program had taken root that flourished in the next director's, Rodney Engard's, administration.

Engard saw his first cactus in Texas at age 10 and, as with Gustaf Starck, the sight touched off a lifelong love of desert plants. With a B.A. in Wildlife Biology he took a course at Arizona State University in cactus and succulents at the Garden. In 1971 he joined the staff as student horticulturist. Later he accompanied Dr. Gentry on collection trips to the wilds of Mexico, describing these trips as "a marvelous learning experience." His other mentor was John Weber, chief horticulturist, who transmitted his own caring attitude toward the Garden's plant collection. Upon Earle's retirement Engard, by then superintendent, took over the directorship.

Engard instilled youthful vigor that resulted in new equipment and new blood for the staff. He created an education department which implemented a docent program and classes and workshops for adults and children. Arts and crafts from desert materials were stressed. Special emphasis was placed on a Christmas decoration workshop.

There were other programs, too. Horticulturists sweated in the summer heat to lay bricks on the dusty surface of Eliot patio. In 1978 a new Australian section was started with seeds from the seed exchange program. This new area is located on seven acres east of an older collection of Australian acacias and eucalyptus planted by Weber in 1963. The new planting posed an immediate problem: thirsty coyotes chewed through irrigation hoses and pulled out the emitters. The solution was to protect the hoses with wire netting.

Income rose from store sales with an expanded stock of quality book and gift items, large-scale plant sales, and, against all precedent, admission fees. In Marshall's time the board had agreed reluctantly to a voluntary admission of 25¢. With the extra income, new research materials and badly needed equipment were purchased for the library.

Publications and public relations also improved, thanks to volunteers with professional experience who gave untold hours to their jobs. Attendance at the annual cactus show swelled, overwhelmingly at times. Engard added another event, which was to become one of the most popular at the Garden — Luminaria Night. The Garden glows with lighted candles in sand-filled paper bags with this Spanish-American Christmas tradition.

When Engard resigned in 1979 to engage in graduate study and later to become director of the Tucson Botanical Garden, he left his successor a promising legacy. It was this that appealed to Dr. Charles A. Huckins.

Attracted by the climate and lifestyle of Phoenix, the 38-year-old sixth director and his wife, Mathilde, came from St. Louis where Dr. Huckins had been chairman of the De-

partment of Indoor Horticulture at the Missouri Botanical Garden. He was the first director at the Desert Botanical Garden with a doctorate in botany, earned at Cornell University in Ithaca, New York. He also held a B.A. in botany from Brown University in Providence, Rhode Island, and a M.A. from Cornell. He had done postdoctoral study in Europe and Asia on a research grant from Oxford University as well.

Rampant inflation demanded an aggressive policy toward more revenue. Increases in the number and amount of both individual and corporate membership fees, entrance and class fees, store and plant sales, plus government funding netted four years of outstanding achievements. Among these were a solar greenhouse; an outdoor lighting system for evening events; computerization of plant records; a strong education program for adults and children with workshops, classes, and field trips; a professional librarian in charge of the library which was open to the public; a publications director who published, the monthly "Saguaroland Bulletin" and many informational brochures; a director of human resources who continues as liaison between staff and volunteers; and a research associate who is developing an ethnobotanical garden of traditional native American plants.

"We can't emphasize enough man's utter dependence on green plants . . . to survive on this earth much longer." With this philosophy, Huckins directed the Garden into greater public service and community involvement. He disseminated information on *all* plants other than native and drought-tolerant ones capable of living in the desert with a certain amount of care. At the end of 1983, he left to become executive director of the American Horticulture Society in Mount Vernon, Virginia. Dr. Huckins, by his last year, had enhanced the Garden's image not only locally, but world-wide. In the spring the Garden received accreditation from the American Association of Museums

The early entrance to the Garden, from McDowell Rd.

An early walk along Eliot Patio of Webster Auditorium

Photo: R.C. Proctor

The early days of the Visitors' Center and Bookstore

Mayor Graham dedicating the Succulent House — Photographed from the left: John Eversole, Reg Manning, Mayor Graham and Hubert Earle

and the American Association of Botanical Gardens and Arboreta. In the fall, after four years of negotiating, the Garden was accepted by COMPAS (Combined Metropolitan Phoenix Arts and Sciences) as its fifth beneficiary, along with the Heard and Phoenix Art Museums, The Phoenix Symphony and the Phoenix Zoo. It meant more prestige and more money for the Garden. It also meant more effort from the growing number of volunteers who increased their effectiveness through the newly-organized group, Friends of the Garden.

The welcoming words of Darrow Tully, publisher of the *Arizona Republic/Phoenix Gazette* and president of COMPAS, would have gladdened the hearts of the Garden founders. He said, "We consider the Desert Botanical Garden an undiscovered jewel."

Dr. Huckins, too, left a rich legacy for his successor, Frederick W. Shirley. As Rachel Carson's lawn boy back in Silver Spring, Maryland, Shirley never dreamed he would one day be director of a botanical garden. The retired U.S. army lieutenant colonel brings to the position experience in public relations and administration, as well as a master's degree in business administration from Arizona State University. Shirley heads a staff of 30, a third of whom have degrees in botany, horticulture or a related science.

1984 was far from Orwellian for the Garden, with improvements to Archer House, now devoted to staff and volunteer use. On the north side of Archer House is the new demonstration garden. It is named for the late John H. Rhuart and was dedicated last October. Rhuart, one of the founders of the Garden and chairman of its board for many years, had a showplace garden of his own named "Las Palmas Altas" on Camelback Mountain. There planting always started in October. It was thus fitting time for the dedication as it marked the beginning of a new phase which is designed to encourage Valley-wide landscaping with drought-resistant plants.

After ffity years the Garden has fulfilled the original purpose of its founders, "to save the desert" with "a gem of which the city will be proud." It is due to the labor, thought, faith, and love of many people who cannot all be named.

Arizona's Tiny Mountain Orchids

by Linda Mankel Reeves

A trip through Cochise County, Arizona, and adjacent territory reveals desert plains interspersed with tall mountain ranges, termed "Islands in the Sky" because of the island-like nature of their isolation from other similar mountain ranges. This isolation is not just geographical, but also biological because populations of animals and plants are cut off from interaction by intervening desert and grassland with members of their own species residing on other mountaintops (Lowe, 1977).

The southern mountains possess an interesting and unique flora quite often overlooked by visitors. A drive from Rodeo, New Mexico, westward through Cave Creek Canyon in the Chiricahua Mountains provides a panorama of the various life zone communities. The trip begins with Upper-Sonoran desert grasslands, passes through Mexican oak-pine associations, riparian groves of walnut, ash and sycamore and culminates in mixed ponderosa pine and Douglas-fir communities at Rustler Park, Barfoot Park and Long Park, 2300-2700 m.

The vegetation of these mountaintop "parks" is similar to that of other southeastern Arizona mountains at the same elevation. Predominant forest species include ponderosa pine *(Pinus arizonica),* Douglas fir *(Pseudotsuga menziesii),* white fir *(Abies concolor)* and Engelmann spruce *(Picea engelmann).* These trees are often festooned with foliose and fruticose lichens.

Due to the proximity of the Sierra Madre Oriental in Mexico and its subtropical montane influence, the area exhibits many features common to mountain regions further south. Major rains occur in late summer and are soon followed by profuse flowering. The fall blossoming is greater than it is during the relatively dry spring. Flowers of such species as *Gilia aggregata, Heuchera versicolor, Salvia lemmoni, Lobelia cardinalis, Penstemon* spp., and others are brightly colored and are visited by hummingbirds.

The hummers apparently can easily see colors in the red range (Faegri and van der Pijl, 1971). More than 12 species of hummingbirds call this area a transient home (Peterson, 1961) and they seem to prefer bright red, rose, orange or violet tubular flowers with large amounts of nectar. This partial reliance of many montane plants on vertebrate pollinators is also a feature of subtropical as well as tropical mountain floras (Faegri and van der Pijl, 1971).

A few subtropical montane plant species extend northward into our area, among them inconspicuous members of the genus *Malaxis* in the Orchidaceae (Kearney, et al., 1960). *Malaxis* is a large, world-wide genus of about two hundred species, with four species occurring in southeastern Arizona and south-western New Mexico namely *Malaxis soulei* (fig. 1), *ehrenbergii* (fig. 2), *M. carymbosa* (fig. 3), and *M. tenuis* (fig. 4). Four other species occur in the continental U.S. — *Malaxis unifolia, M. monophyllos, M. spicata Swartz* and *M. paludosa* — but do not occur in Arizona (Luer, 1975). *Malaxis paludosa* is restricted to northern Minnesota, although more commonly found in Alaska and parts of Canada.

All of Arizona's species of *Malaxis* are small-flowered, delicate and inconspicuous members of the herbaceous flora. In southeastern Arizona, the four species are restricted to elevations above 2000 m, and are found primarily in Douglas-fir forest. They grow commonly in thick conifer litter on slopes under fir, Douglas fir and ponderosa pine trees. *Malaxis soulei* is often found on more level, sunny sites, but all four species may

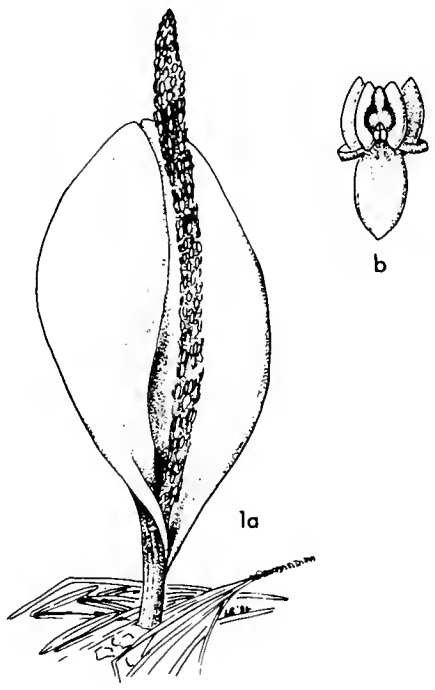


Figure 1. *M. soulei.* Inflorescence a thick spike of sessile flowers, up to 150 per spike, verdigris-green or opaquely yellow-green or both, 4-6mm in length, lip uppermost, leaf ovate to elliptical, 3-5cm in length.

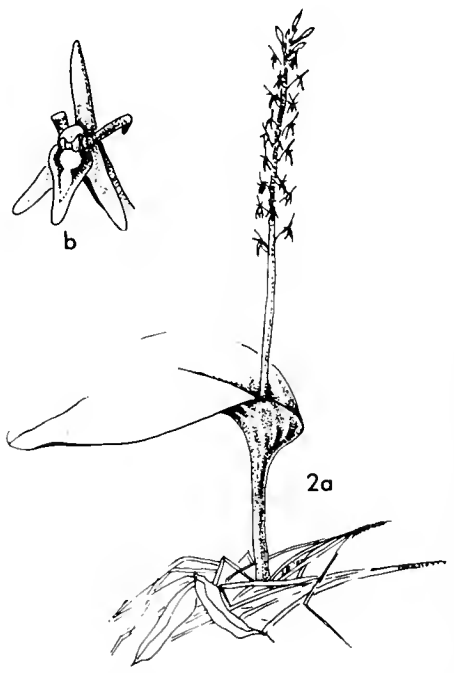


Figure 2. *M. ehrenbergii.* Inflorescence a raceme or corymb-like raceme, less than 80 flowers per raceme. Flowers sanguine or brown-red, 4-6mm in length, lip lowermost, leaf ovate to subcordate, 2.5-10cm in length.

grow in close association. In the major portion of their range, farther south into Mexico and Guatemala, they commonly occur with ponderosa pine and other high-elevation pine associations (Luer, 1975).

In the Arizona species, the inflorescence is a tall spike-like terminal or corymbose raceme and is borne on a bulb-based stem bearing one slightly leathery, bright green leaf. The flowers are green in most species but sanguine or brown-red in *Malaxis ehrenbergii*) and range in size from four millimeters in *M. soulei* to thirteen millimeters in *M. tenuis*.

Observations of some of these species pose interesting questions, particularly in relation to pollination mechanisms. *Malaxis corymbosa* flowers are almost transparent and yellow-green; they are held in a horizontal position. One might suppose this feature could provide a "landing platform" for pollinating insects. Flies seem to prefer transparency in flowers (Faegri and van der Pijl, 1971) and *Malaxis corymbosa* could accommodate a small, robust species. *Malaxis ehrenbergii* has virtually no landing platform for pollinating insects. The sanguinous flowers are produced vertically on a raceme, then gradually turn downward to a horizontal position as they age. The color and size of the flowers suggests a small wasp as a possible pollinator.

Malaxis tenuis flowers are produced horizontally and face down. They appear to have a totally green coloration, but close inspection reveals blue-green stripes at the edge of the lip and an orange-tipped column. This is an evolutionarily "advanced" orchid structure which contains the fused stamen, stigma and style.

The orange color on the column tip of *M. tenuis* might have evolved for insect attraction, since the fused pollen structures, the pollinia, are located on the column tips lower surface. A mosquito, crane fly or slender midge could possibly probe the area for nectar and the pollinium could be deposited on the proboscis.

Malaxis soulei produces a thick spike of closely appressed flowers, as many as 150. The flowers are small, less than four millimeters long and are held vertically. In many specimens, the lower flowers are yellowish-green, the upper flowers are verdigris-green and each "color group" opens separately! Close examination of the floral spike from the bottom up will reveal that the lower yellowish-green flowers are open and that a section of unopened flower buds remains. This is followed by open, verdigris-green flowers and finally, by more unopened buds. The speculations regarding the pollination strategy of this plant are many. This characteristic bud-opening may encourage cross-pollination, but frequent visitation of a particular plant by an insect or more than one type of insects also a possibility.

The following is a key to the species of *Malaxis* as they occur in southeastern Arizona.

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Key to *Malaxis* Species Native to Arizona

(Illustrations, a = habit; b = detail of flower)

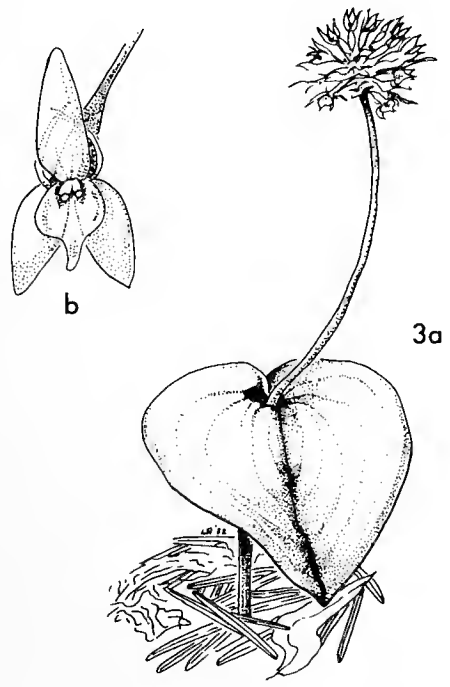

Figure 3. *M. corymbosa*. Flowers green or transparent yellow-green. Inflorescence a corymb-like raceme, flowers transparent yellow-green, 6-10mm in length, lip lowermost, leaf ovate to cordate, 2.5-10cm in length.

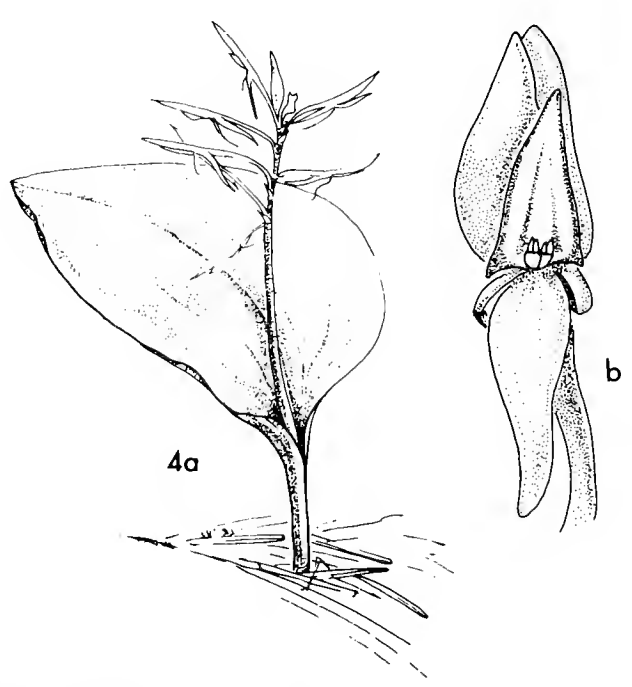

Figure 4. *M. tenuis*. Inflorescence a raceme, flowers green, the lip edged with verdigris-green, 9-13mm in length, lip uppermost, leaf ovate to subcordate, 2.5-8cm in length.

Herbarium Leaves

by Bruce Parfitt
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The Pinacate Region, which lies to the north and northwest of Puerto Penasco ("Rocky Point" to Arizonans), Mexico, with its northernmost fringe extending into Arizona to the southeast of Yuma, is an area of rugged lava flow that is surrounded by shifting sand.

This unusually hot, dry desert represents a unique habitat in Arizona. Because of this uniqueness and the region's geographic and floristic proximity to Mexico, it has been an area of great interest to botanists.

In recent years, hopeful collectors visiting this area have made important contributions to our knowledge of the flora. In 1978 Timothy Reeves and Elinor Lehto of Arizona State University rediscovered Schott's wire lettuce (*Stephanomeria schottii*) in the Pinta Sands. It had been previously collected only once before, in 1855, and was later presumed extinct. Subsequently, in 1982, Wendy Hodgson and Rodney Engard, formerly director of the Desert Botanical Garden and now director of Tucson Botanical Garden, found the species to be common at another locality just east of Yuma. These two groups of collectors also added to the number of localities known for the blue sand lily *(Triteliopsis palmeri).* It was known previously in Arizona from a single specimen collected in 1949.

What turned out to be of the greatest interest on the Desert Botanical Garden's 1982 trip was the discovery of an inconspicuous sand-herb *(Drymaria viscosa)* along the eastern edge of the Pinacate Lava Field. With spreading stems only about six inches (15 cm.) long and camouflaged with adhering grains of sand, this plant is so subtle that, prior to 1980, it was believed endemic to Baja California, Mexico. In that year it was reported from the Mexican state of Sonora.

Drymaria viscosa

With no real expectations and with only the hope that they would find something of interest, Hodgson and Engard collected the first record of this species in the United States. A report on this significant range extension together with a discussion of the plant's scientific name was written by Bruce Parfitt and Wendy Hodgson and and will be published in SIDA, a scientific journal of contributions to botany, in spring of 1985.

Archer House in 1952; it has changed quite dramatically since then

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